Tables: Order, Stock, Customer, Employee, Portfolio, Account

Order

1. Order ID - Primary Key
2. Stock Symbol - Foreign Key
3. Order Type - [Buy, Sell]
4. Number of Shares - Bigger than 0, Less than or equal to available
5. Customer Account Number - Foreign Key
6. Date/Time (the order was placed)
7. Transaction Fee
8. Price Type - [Market, Market on Close, Trailing Stop, Hidden Stop]
9. Employee ID - Foreign Key

CREATE TABLE ORDER (

OrderId INTEGER AUTO\_INCREMENT,

StockSymbol VARCHAR(5) NOT NULL,

OrderType OrderTypes NOT NULL,

NumShares INTEGER,

CusAccNum INTEGER DEFAULT 0 NOT NULL,

Timestamp DATETIME NOT NULL DEFAULT NOW(),

TransFee FLOAT(2),

PriceType PriceTypes,

EmpId INTEGER DEFAULT 0 NOT NULL,

PRIMARY KEY (OrderId),

UNIQUE (StockSymbol, Timestamp, CusAccNum, EmpId),

FOREIGN KEY (StockSymbol) REFERENCES STOCK

ON DELETE SET NULL

ON UPDATE CASCADE,

FOREIGN KEY (CusAccNum) REFERENCES ACCOUNT(AccNum)

ON DELETE SET DEFAULT

ON UPDATE CASCADE,

FOREIGN KEY (EmpId) REFERENCES EMPLOYEE

ON DELETE SET NULL

ON UPDATE CASCADE,

CHECK (NumShares > 0),

CHECK (TransFee > 0)

)

CREATE DOMAIN OrderTypes VARCHAR(4)

CHECK (VALUE IN (‘Buy’, ‘Sell’))

CREATE DOMAIN PriceTypes VARCHAR(15)

CHECK (VALUE IN (‘Market’, ‘Market on Close’, ‘Trailing Stop’, ‘Hidden Stop’))

CREATE ASSERTION ValidNumShares

CHECK (NOT EXISTS

(SELECT \* FROM Order, Stock

WHERE ORDER.NumShares <= STOCK.NumAvailShares

AND ORDER.StockSymbol = STOCK.StockSymbol))

Stock

1. Stock Symbol - Primary Key
2. Stock Name
3. Stock Type
4. Share Price
5. Number of Shares

CREATE TABLE STOCK (

StockSymbol VARCHAR(5),

StockName VARCHAR(20) NOT NULL,

StockType VARCHAR(20),

SharePrice FLOAT(2) NOT NULL,

NumAvailShares INTEGER NOT NULL,

PRIMARY KEY (StockSymbol)

UNIQUE (StockName)

CHECK (SharePrice > 0),

CHECK (NumAvailShares > -1)

)

Customer

1. Last Name
2. First Name
3. Address
4. City
5. State
6. Zip Code
7. Telephone
8. E-mail Address
9. Rating
10. Customer ID - Primary Key

CREATE TABLE CUSTOMER (  
 LastName VARCHAR(20) NOT NULL,

FirstName VARCHAR(20) NOT NULL,

Address VARCHAR(50),

City VARCHAR(20),

State VARCHAR(20),

ZipCode CHAR(5),

Telephone CHAR(10),

Email VARCHAR(50),

Rating Ratings,

CusId INTEGER AUTO\_INCREMENT,

PRIMARY KEY (CusId)

)

CREATE DOMAIN Ratings INTEGER

CHECK(VALUE > -1 AND VALUE < 11)

Employee

1. Social Security #
2. Last Name
3. First Name
4. Address
5. City
6. State
7. Zip Code
8. Telephone
9. Start Date
10. Hourly Rate
11. Employee ID - Primary Key

CREATE TABLE EMPLOYEE (

SSN CHAR(9) NOT NULL,  
 LastName VARCHAR(20),

FirstName VARCHAR(20),

Address VARCHAR(50),

City VARCHAR(20),

State VARCHAR(20),

ZipCode CHAR(5),

Telephone CHAR(10),

StartDate DATETIME,

HourlyRate FLOAT(2),

EmpId INTEGER AUTO\_INCREMENT,

PRIMARY KEY (EmpId),

UNIQUE (SSN)

)

Portfolio

1. Account Number - Candidate Key, Foreign Key
2. Stock Symbol - Candidate Key, Foreign Key
3. Number of Shares - If zero, delete record
4. Stop - [Trailing, Hidden, Null]
5. Stop Price - Can be Null

CREATE TABLE PORTFOLIO (

AccNum INTEGER,

StockSymbol CHAR(5),

NumShares INTEGER,

Stop Stops,

StopPrice FLOAT(2),

PRIMARY KEY (AccNum, StockSymbol)

FOREIGN KEY (AccNum) REFERENCES ACCOUNT

ON DELETE NO ACTION

ON UPDATE CASCADE,

FOREIGN KEY (StockSymbol) REFERENCES STOCK

ON DELETE CASCADE

ON UPDATE CASCADE,

CHECK (NumShares > -1)

)

CREATE TRIGGER DeleteOnZeroShares

AFTER UPDATE OF NumShares ON PORTFOLIO

FOR EACH STATEMENT

DELETE FROM PORTFOLIO

WHERE

EXISTS (SELECT \* FROM PORTFOLIO P

WHERE P.NumShares = 0)

CREATE DOMAIN Stops

CHECK(VALUE IN (‘Trailing’, ‘Hidden’))

Account

1. Account Number - Primary Key
2. Account Creation Date
3. Credit Card Number
4. Stock Portfolio - Don’t think we need this
5. Customer ID - Foreign Key

CREATE TABLE ACCOUNT (

AccNum INTEGER AUTO\_INCREMENT,

AccCreDate DATETIME,

CreditCNum VARCHAR(16) NOT NULL,

CusId INTEGER NOT NULL,

PRIMARY KEY (AccNum),

FOREIGN KEY (CusId) REFERENCES CUSTOMER

ON DELETE NO ACTION

ON UPDATE CASCADE

)

Rationale:

* ids auto increment
* Order
  + employee id and customer acc number set default of 0 for in case one is not part of the transaction
  + candidate key - only one order can be placed at any one time for one stock by one customer
  + triggers
    - stock - set default wouldn’t work because other stocks may have the default name by accident; no action wouldn’t work because companies can go private or bankrupt and we need to be able to remove stocks
    - customer account - no action won’t work bc customers must be deletable for closed accounts; set default won’t work bc we want to differentiate not participating from closed account
    - employee id - no action won’t work bc employees must be deletable for being fired; set default won’t work bc we want to differentiate not participating from fired
* Stock
  + name is candidate key - can’t have two stocks for one company
* Customer
  + assuming all users are from the US thus no need for country or incorrectly formatted telephone number
  + no candidate keys because customers can have the same name (family) and share contact info as though in a business together